Imaging

A NOVEL METHOD TO QUANTIFY THE INSTANTANEOUS MITRAL REGURGITANT RATE

Poster Contributions
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Background: A pitfall in the assessment of mitral regurgitation (MR) is the systolic variation of the MR jet. The ASE guidelines advise using quantitative parameters that account for the systolic variation of MR. We developed a novel technique using MRI to calculate the instantaneous MR rate.

Methods: 41 patients (58 ± 15yrs, male 60%) with MR who underwent evaluation with MRI were included in this study. MR was calculated as the difference of LVSV and forward flow. For each patient the aortic flow and LVSV were plotted against time using the onset of the QRS complex. For each patient, systole was divided evenly into early, mid, and late. The MR rate was calculated for each third of systole as the difference of the area under the curve for LVSV and the aortic flow. To quantify the systolic variation of MR rate, a peak-to-average regurgitant rate (PARR) ratio was calculated for each patient.

Results: 34 (83%) patients had non-severe MR and 7 (17%) patients had severe MR. There was significant variation of MR rate with a 2.0 fold and 1.2 fold difference between the lowest and highest MR rate in patients with non-severe and severe MR respectively. The PARR ratio was significantly higher in patients with non-severe MR compared to patients with severe MR (1.7 ± 0.4 vs.1.3 ± 0.2, p = 0.02). The distribution of the PARR ratio is shown in Figure 1.

Conclusions: The systolic variation of MR rate is greatest among patients with non-severe MR. This finding highlights the need to account for the systolic variation of MR as per the ASE guidelines.